

# Covid-19 Pandemic, 4<sup>th</sup> Industrial Revolution and Human Capital Development

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## Abstract

*The covid-19 pandemic hit global sustainability very hard. It slows down worldwide growth and affects health, environment, education, business, and manufacturing worldwide. Global inequality is increasing. The world was under lockdown fully or partially for several months to fight against the coronavirus from the beginning of the declaration of the covid-19 pandemic. During the lockdown, the world mainly depended on different technologies for global mobility and control pandemics, mostly digital technologies. This technological advancement will play a revolutionary role in all the affected areas' sectors during and after the covid-19 pandemic. Where the 4<sup>th</sup> industrial revolution will run faster to minimise the global losses. The countries are not yet comprised of the 4th industrial revolutionary system, and technologies will require faster adoption of the industry 4.0 standard and technologies to add value to the global value chain. Skill development for the unskilled or low-skilled workforces and the development of the innovative ideas for the new products and services for business and manufacturing will be the key policy issue of the world to adjust with the industry 4.0 standard specification, work and environment to achieve the goals of SDG 2030.*

**Keywords** *Human Capital · Technology · 4IR and Skill*

## 1. Introduction

There are several types of criticism about Covid-19: A bioweapon, a conspiracy theory, an environmental effect, and an economic war. Covid-19 has already become a scientific revolution, a substantial paradigm shift that affects the global value chain. It will ultimately change the international socio-economic scenario.

Covid-19 was started in China and affected the entire world. On 31 December 2019, The World Health Organization officially informed us about the coronavirus

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infection detected in Wuhan, China. From 1 January 2020, Wuhan was closed for environmental sanitation and disinfection. The WHO declared the outbreak a global public health emergency on 30 January 2020. The WHO declared this outbreak as a pandemic on 11 March 2020.

The Covid-19 pandemic was spreading very fast over the world. The countries of the world were fully or partially lockdown. The economic damage represents the most extensive economic shock that the world has not experienced before. According to the Global Economic Prospects, a 5.2% per cent contraction in global GDP in 2020 is the deepest global recession. The recessions triggered by the pandemic are expected through lower investment, an erosion of human capital through loss of work, and fragmentation of international trade and supply linkages.

## **2. Methodology**

Due to the Covid-19 pandemic, the world was on lockdown, and physical communication for data collection and information was critical for most organisations. The global conferences, seminars, workshops, and demonstrations during the lockdown were held virtually. The paper is based on observational methodology via the internet. The observations were on the global conferences, seminars, workshops, and demonstrations.

## **3. Impact of Covid-19 pandemic and Macro Economy**

The Covid-19 pandemic is a public health emergency affecting the global socio-economy. The virus has spread to virtually every corner of the globe. It prompted governments to impose quarantines, travel restrictions, and other measures to minimise risks. These risk mitigation actions have caused a significant shock to the global economy in today's highly connected and globalised world.

Covid-19 has disrupted the Chinese economy and is spreading globally. The evolution of the disease and its economic impacts are highly uncertain, making the formulation of appropriate macroeconomic policy responses challenging. World Bank and IMF estimate that the central government debt will increase on average by 4.6%, and the unemployment in the pre-Covid period was 6.9%. Until April 2020, 6.8% was increased to 9.5% by April 2021, decreasing at a significantly slower pace.

### **National Income**

National income is measured by the output method by calculating the total value of goods and services produced during the year.

The virus that started in China is now delivering a significant global shock. Like in most other nations, the outbreak of the Covid-19 pandemic is an unprecedented shock to Bangladesh's economy.

## GDP Growth

Most countries measure GNP or GDP at current (market) prices. When an economy grows, that is for enough wealth and new job opportunities.

GDP growth is measured by the percentage change in gross domestic product or the value of goods and services produced within a certain period.

The IMF estimates that the global economy will shrink by 4.4% in 2020. This decline is the worst since the Great Depression of the 1930s.

Figure 1: Growth Forecast

Year	Global Economy			Advance Economy			Developing Economy		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Growth	2.9	-4.9	5.4	1.7	-8	4.8	3.7	-3	5.9

**Source:** World Economic Outlook Update June 2020.

Year	Global Economy			Advance Economy			Developing Economy		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Growth	-3.2	6.0	4.9	-4.6	5.6	4.4	-2.1	6.3	3.2

**Source:** World Economic Outlook Update July 2021.

## Savings

In most advanced economies, there is a large amount of accumulation of household savings. The size and amount of savings accumulated since 2020 can potentially redesign the post-pandemic situation.

At the same time, limited resources and weak institutions constrain the capacity of many low-income and developing governments to support their economies.

Without international cooperation and support for the low-income and underdeveloped countries, development prospects will be negatively affected.

## Investment

Foreign Direct Investment (FDI) flow decreased globally by 35% in 2020. Lockdowns caused by the Covid-19 pandemic slowed down existing investment projects in almost all countries. FDI is an important source of external finance for low-income and developing countries.

The recession caused by the pandemic led national and multinational enterprises to reassess new projects and look for safe new investment opportunities for their risk-adjusted return.

## Gross Capital Formation

The covid-19 pandemic is changing the gross capital formation around the world. The gross addition to the fixed asset for capital formation is transforming. Investors are investing in the new area of opportunities upon assets for safer goods and values.

They are green, human capital, digital, and bio and genetic innovation. Mainly upon the goods and services have the potential to add value with the sustainable value chain.

### **Price**

The amount of money given sale of a specified thing. Price is the quantity of one thing exchanged in barter or sale for another.

The global economic shock of the Covid-19 pandemic has driven most commodity prices down and is expected to result in substantially lower prices over 2020 [The World Bank, April 2020, Commodity Market Outlook].

Crude oil prices fall about 50 per cent between January and March 2020. The decline in crude oil prices resulted in uncertainty in production agreements among the OPEC and other oil producers with the rest of the world.

Overall energy prices, including fossil fuel, natural gas, and coal, are expected to average 40 per cent lower in 2020 but rebound in 2021.

### **Inflation**

Inflation is the rate at which consumer purchase power changes. Consumer spending is one of the most important driving forces for global economic growth. Covid-19 has changed every aspect of our daily lives, and consumer spending is no exception.

During lockdowns caused by the Covid-19 pandemic, industries and shops were closed, production and sales were closed, and people were at home.

In advanced economies, people have the savings to redesign their daily life, and the governments have the power to shape the policy to redesign the post-pandemic recovery.

The current inflationary condition is a mismatch between demand and supply. Easing lockdown quickly brought back demand from consumers who were at home for a long time and were eager to spend. But during the lockdown, shops and industries were closed and did not produce much to meet the present demand. Recently rising oil prices and raw materials have increased the cost of production and transportation, causing inflation. Only debtors can gain from inflation because they repay creditors.

But in the low-income and developing economies, during lockdowns, the people were at home, they expense their savings, took loans with higher interest and had nothing to shape their recovery policy at a higher percentage of the industries and consumers. In these countries, their policy conclusion comes with international support. That international financial support is exchanged by the currencies favouring a small selected group of countries.

## **Government Revenue and Expenditure**

Government Revenues are the financial resources for ensuring the government functions and distributes social goods and services to the nation by spending on government consumption, transfer payment, and interest rate.

## **Money and Credit**

In advanced economies, private funding is growing savings for the economic slowdown. Governments also borrow money quickly as the interest rate is zero or minimum though the GDP debt ratio increases. They don't care because there is no inflation pressure in advanced economies.

But in low-income and developing countries with a weak fiscal policy is very difficult to control inflation.

In a flexible monetary policy response, by expanding the money supply in the economy, lower interest rates on credits can increase the economy's investments.

## **Interest Rate**

Higher interest rates encourage saving and discourage borrowing and spending. The companies then increase their price slowly to increase demand. It reduces inflation. Lower interest rates work oppositely and can help increase inflation if it is too low.

When inflation rise above the expected rate, the central bank increase the interest rate. If inflation drops below the target rate, they might lower interest rates.

In the low-income and developing economies, the purchasing power has become the lower position for both the individuals and the industries. For the economic continuity, a lower interest rate is the most favourable condition for the low-income and developing countries.

## **Capital Market**

The covid-19 pandemic triggered a free fall in share prices. The world is transforming our lives, economies, and businesses' fortunes, which is reflected in the ups and downs of share prices. In this situation, some companies rise at an unprecedented speed, and some fall in the downturn.

Stock, bonds, or other investment products are financial instruments or assets.

Covid-19 changes the traditional mode of capital formation. Green innovation, human capital, digital innovation, bio and genetic innovation. They are mainly intangible assets. Policy to increase investment in the sectors of economies are dealing with intangible assets for capital formation can save the world from the shortage of capital stock. This was the leading cause of growth slowdown before the Covid-19 pandemic in the advanced economies. Covid-19 losses the global growth and is to be survived, where intangible assets can introduce new production and capital can help stabilise the capital market.

### **Import and Export**

The Covid-19 pandemic has drastically affected lives and livelihoods. It has disrupted economic activities throughout the world. World merchandise trade flows decreased by 7% in 2020.

The pandemic delivered a shock from both the supply and demand sides. During the lockdown, the domestic demand from each country has decreased for maximum commodities resulting in a decrease in imports. It ultimately reduces the export from the partner countries of business.

### **Balance of Payment**

Covid-19 has resulted in a significant increase in external debt in developed and developing countries. The covid-19 pandemic has negatively affected the global supply chains and economic integration in the world economy. Its consequences have been evident in the slowdown in the economies of developed and developing countries and the decline in foreign trade and investments. It is confirmed by the balance of payments of these countries. Pandemic, declining export earnings, covering the trade deficit could lead to the depletion of foreign reserves.

### **Balance of Trade**

The covid-19 pandemic hit the countries at different times and rates worldwide. Access to global demand and continued trade will be necessary for supporting and sustaining economic recovery.

Global cooperation must keep trade flowing in the current crisis and ensure global recovery. Trade facilitation, government support, and global value chains for essential goods, services, and trade are the primary indicators for recovery.

### **Remittance**

According to the World Bank's Migration and Development Briefing, the Covid-19 pandemic and economic crisis continue to spread, and the amount of money migrant workers send home is projected to decline 14 per cent by 2021 compared to the pre-Covid-19 levels in 2019.

Remittance flow fell by 7 per cent in the low and middle-income countries in 2020 and 7.5 per cent in 2021. The primary cause of the decline in remittances is weak economic growth and employment levels in migrant-hosting countries, weak oil prices, and depreciation of the currencies of remittance-source countries against the US dollar.

### **Labour Market-Employment-Wage**

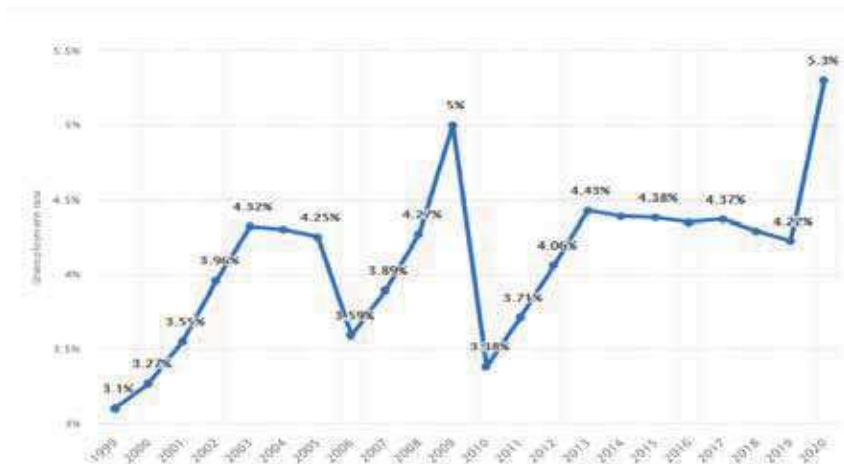
A labour market in an economy functions with the demand and supply of labour. Employers compete to hire the best in the labour market, and the workers compete for the best satisfying job.

Just as in any market, the price of labour, the wage rate, is determined by supply and demand. When labour supply increases, the equilibrium price falls, and when the demand for labour increases, the equilibrium price rises.

A wage increase is a higher income; a higher wage induces a greater labour supply.

The ongoing Covid-19 pandemic has created an unprecedented crisis in Bangladesh that risks erasing the substantial progress in household incomes and poverty reduction achieved during the past decades.

Figure 2: Unemployment Rate in Bangladesh



Source: Statista 2021

The Covid-19 crisis is expected to wipe out 6.7 per cent of working hours globally in the second quarter of 2020, equivalent to 195 million full-time workers [ILO press release 7 April 2020].

The eventual increase in global unemployment between 2021 and 2022 will depend substantially on future developments and policy measures. Delegates from 181 countries representing the Governments, workers and employers at the International Labor Conference in Geneva adopted a Global Call of Action for a human-centred Covid-19 recovery that prioritises creating decent jobs for all and addresses the inequalities.

### Foreign Currency Reserve

Foreign exchange is the conversion of one country's currency into another. The value of any particular currency is determined by market forces related to trade, investment, tourism, and geopolitical risk.

In Bangladesh, Foreign Exchange Reserves are the foreign assets held or controlled by the central bank of Bangladesh. The reserves are made of gold or a

specific currency. They can also be special drawing rights and marketable securities denominated in foreign currencies like treasury bills, government bonds, corporate bonds, equities, and foreign currency loans.

Foreign Exchange Reserves in Bangladesh decreased to 46199.80 USD Million in September from 48060 USD Million in August 2021 [Source: Bangladesh Bank].

### **Exchange Rate**

Exchange rates play a vital role in a country's level of trade, which is critical to most every free market economy in the world. The currency exchange rate is one of the most vital determinants of a country's relative level of economic strength.

A higher-valued currency makes a country's imports less expensive and exports more expensive in foreign markets. A lower-valued currency makes a country's imports more expensive and exports cheaper in foreign markets. A higher exchange rate can worsen a country's balance of trade, while a lower exchange rate can be expected to improve it.

### **Rise of Digital Currency in the International Monetary System**

There is a rule in international monetary policy to fix the exchange rate and equalise the balance of payment and international currency. The present monetary policy of the world is not a policy where developing and developed countries are participating in fixing the policy in terms of the exchange rate. The countries' currencies are held in the international financial centres like the EU, USA, UK, Switzerland and Japan, and they decide the exchange rate.

The global gold market is an influential element in the developing countries, mainly India and China, because they are a big recipient of gold. The dollar's role in the international monetary system has decreased but still plays an important role. EURO has already taken a secondary position after the US dollar. Chinese currencies Renminbi has already entered the global market as the 5<sup>th</sup> global currency, and they have a complete transactions around the world for their business and trade.

The international monetary system is a set of internationally agreed rules, conventions and supporting institutions that facilitate international trade, cross-border investment and generally the reallocation of capital between nation-states. It should provide means of payment acceptable to buyers and sellers of different nationalities, including deferred payment.

The interest in CBDCs (Central Bank Digital Currencies) arises from developments that started with the 2008 financial crisis, the appearance of cryptocurrencies and the rise of digital transactions, leading to the decreasing role of physical notes and cash. The situation is again coming to us during the Covid-19 pandemic, and it will remain in the world for its acceptability.



Digital currency is a payment method which exists only in electronic form and is not tangible. Digital currency can be transferred between entities or users with the help of technology like computers, smartphones and the internet.

Cryptocurrency is a digital currency in which encryption techniques regulate the generation of currency units and verify the transfer of funds, operating independently of a Central Bank.

IMF introduced international currency in 1967 as SDRs (Special Drawing Rights). Is non-cash money only in accounting entry in a bank account? Central Bank and certain financial institutions are only allowed to use SDRs. SDR is used to country obligations under the current balance of payment and during the comparison of exchange rates in international settlement.

In 2019, After Facebook's proposal to create Libra, a global digital currency based on blockchain technology. Central banks are actively discussing issuing digital national currencies. IMF is also debating the digital version of SDRs.

Libra is a permission blockchain digital currency proposed by the American social media company Facebook, Inc. China is also trying to launch its official digital currencies.

Cryptocurrency is an international digital currency that has become SDR. Cryptocurrency increases reserves outside the central bank because of its fast and easy operability. Crypto assets are increasing the reserves. Crypto assets are intangible digital assets. They range from bonds, stocks & digital currencies to intellectual property. Trade secrets, training material and licenses are also intangible assets.

Currencies are coming as the new international currency for payment and create value of the assets as an alternative to US dollars. Digital currencies are coming as SDRs and national digital currencies. The digitalisation of the currencies is changing the nature of payment and creating value and alternative reserves. The countries will participate in the transaction of these currencies regionally or globally will increase the value of these currencies. There will be possibilities for the developing nations to participate in international monetary policy because the role of developing countries in the global economy is growing. The international monetary policy will gain stability through the participation of the developing and developed countries.

#### **4. Covid-19 and Human Healthy Longevity**

Global life expectancy at birth in 2016 was 72.0 years (74.2 years for females and 69.8 years for males). Women live longer than men all around the world. The gap in life expectancy between the sexes was 4.3 years in 2000 and had remained almost the same by 2016 (4.4). Global average life expectancy increased by 5.5 years between 2000 and 2016.

In 2020, life expectancy at birth for Bangladesh was 72.87 years. In Bangladesh, the life expectancy at birth has increased from 46.59 years in 1971 to 72.87 years in 2020, growing at an average annual rate of 0.92%.

### **Mortality and Morbidity**

Mortality and morbidity describe the frequency and severity of specific illnesses or conditions.

The Covid-19 pandemic and the social distancing measures used to contain the spread of the virus have altered everyday life around the world. It increases mortality and morbidity.

Mortality is another term for death. A mortality rate is the number of deaths due to a disease divided by the population.

Morbidities are not deaths but illnesses of a specific disease. The morbidity rate is a measure used to determine morbidity in a population.

The world is not still having a clear picture of the global mortality and morbidity due to the coronavirus. The people who died over the globe during the Covid-19 pandemic were not from coronavirus but other respiratory syndromes. There was an inefficient data management system to give a clear picture of mortality and morbidity. The world was unclear about which respiratory syndrome is more dangerous than the coronavirus and which is less risky.

### **Health and Human Capital**

Health is a kind of human capital and an input to producing other forms of human capital like education, training and skill. Unhealthy human capital and the inability to invest in health development resulting in worse health implies lower income.

Only a healthy person can work efficiently and with full potential. A healthy person can work more effectively. A healthy person can work in a productive way, and in this way, it can contribute better to the development of the country's economy.

Manufactured capital may depreciate over time, but human capital is not consumed in producing goods and services.

## **5. Covid-19 and Human Knowledge**

The world economy is transforming toward a knowledge-based economy, and society is transforming toward a knowledge-based society. The global socio-economic structure is changing very fast based on knowledge.

This transformation of the world is not always maintaining a sustainable standard. Education, training and skill development can ensure increased productivity and sustainability.

Knowledge promotes protective behaviours by buffering the adverse effects of pessimistic illness expectations. Essential workers are likelier to have low levels of expertise with strong illness expectations, suggesting that educational policies may be warranted.

### **Education**

Knowledge through education promotes protective behaviours by buffering the adverse effects of pessimistic illness expectations. Knowledge-based economies need innovations and ethics on innovation for sustainable production and service to increase value and competitiveness. Continuous research in educational institutions is critical in directing a nation towards sustainable innovation.

Technological inclusion in the institution has opened many new educational development doors. Still, the low-income and developing nations cannot take advantage due to policy measures and finances. During Covid-19, the developed nations achieved more than 83% of educational facilities, but low-income and developing countries were only less than 23%.

### **Training**

Training for teachers, trainers and employees are essential for developing related instruction capability. Covid-19 changed the traditional training mode due to the rapid adoption of automation, digitalisation and robotisation in government, health, academic, business and manufacturing sectors.

### **Skill Development**

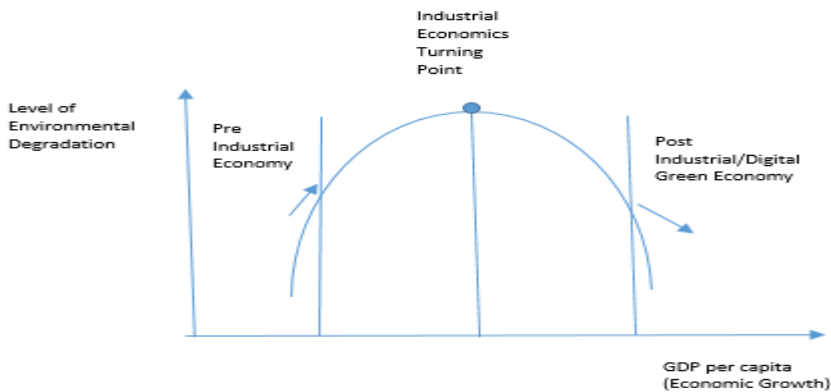
Skill development is an essential part of a nation for the development in all areas of its activities. The covid-19 pandemic has proved the potentiality of disruptive technologies in global socio-economic activities. The world is adopting these technologies very fast.

Bangladesh is a middle-income country already in a good position for its growth. The government is adopting disruptive technologies. As fast as it can develop its national skill to operate and govern these technological adoptions in the right direction, it will contribute more to the global economy by reducing global growth slowdown.

## **6. Covid-19 and the Rise of the 4<sup>th</sup> Industrial Revolution**

The global pandemic caused by the coronavirus has disrupted people's lives. Covid-19 is a health issue and affects economic matters. This health and economic issue accelerated the implantation process of the fourth industrial revolution. 4th industrial revolution is a Digital, Physical and Biological combination called the cyber-physical system of manufacturing and business. It is a related business and manufacturing system nationally and globally by using disruptive technologies. The technology associated with 4IR offers conditions for humans to have developed in various segments of their lives.

Figure 3: U-Shaped curve for economic growth and the environment



The U-shaped curve shows the relationship between economic growth and the environment up to a certain point when economic growth worsens the environment. Still, after that, the move to a post-industrial economy moves towards a better environment.

But, the world has suffered a growth slowdown for the past several years. Moreover, the Covid-19 pandemic affects manufacturing and services worldwide, which turns the global growth almost to the zero level and for some countries, that is negative.

To reach the next normal of the world, there are no alternatives to growing the economy except a faster pace of increased productivity than ever before. An increase in productivity to raise the income of individuals and the country is the first condition to reach the previous level of growth and to minimise the average level of intended development for the world to reduce poverty and inequality.

Industrial production and services will have to run together to achieve GDP growth. But there are the risks of the next pandemic for the global need, and the trend of over-productivity may affect the health and environment are interrelated. The technology associated with 4IR offers conditions for humans to have developed in various segments of their lives.

## 7. Covid-19 and Real Income

The Covid-19 pandemic has had a massive impact on economic activity worldwide. For the recovery from the economic consequences of the pandemic, most governments have used a combination of family income support and credit facilities for firms. Governments also expanded unemployment incentive schemes to stabilise the workers' income and contain the impact of the crisis on consumption and economic inequality.

### **Real income decreases in the low income and developing countries, and the rising poverty level**

But the effectiveness of these policies remains unclear, mainly due to a lack of reliable data and information, corruption in distribution and monitoring and the indicators allowing for tracking economic activity. This limits the ability of policymakers to rapidly adjust their responses in the effort to “flatten the recession curve” after flattening the infection curve.

Real income decreases in low and developing countries and rising poverty levels create inflation. Adjusting the inflation only by the government support without international financial cooperation may take a long delay to reduce inflation created by the loss of real income.

### **Production**

Covid-19 has had enormous impacts on global production and international trade. The covid-19 Pandemic has forced manufacturing companies worldwide to think about their business strategy and operations to ensure the health and safety of their workforce and keep their organisations operating in a rapidly evolving environment.

The global impact of Covid-19 on manufacturing has short and long-term implications. Manufacturers face challenges and look for opportunities for recovery in an uncertain future. The COVID-19 pandemic will transform global production.

### **Distribution**

Covid-19 has had a supply chains effects on both supply and demand. The sudden halt of manufacturing and distribution facilities and people being cooped up in their homes for months have driven up demand for products.

There was also a labour shortage in manufacturing and distribution, and the border was closed. The commercial product distribution was under considerable disturbance.

Health products were distributed by maintaining health measures among the world's countries to control the pandemic.

### **Changes in the Determinants**

Flattening the recession curve after flattening the infection curve mainly depends upon improving the socio-economic determinants.

Health is an essential social determinant that has changed during Covid-19. Social determinants of health are critical for improving overall health and reducing health disparities often rooted in social and economic disadvantages.

Income is an important social determinant of health. An increase in income can afford medication, a healthy diet, and a good place to live can increase health status.

Technology is an essential macroeconomic determinant that has changed the pattern of the Global Value Chain for increased value, productivity and income.

## **8. Discussion**

Coronavirus first affected China in 2019. China first declared the genome sequence of the coronavirus, and then the world found medicine for temporary medication before the vaccine against the coronavirus by using AI technology.

Before any vaccine against the coronavirus, the world was on lockdown. Communication was dependent on the internet and digital technologies for global mobility and continuity in health, education, business, and governance everywhere.

Then the virus spread worldwide and was declared a Covid-19 pandemic. The virus was detected in the human body by digital technology. Digital technologies were used to disinfect hospitals, homes, and roads. The researchers collect data and information about the disease worldwide through the internet and analyse them on a computer using AI and 3D image processing for the new Vaccine. Then they combine AI, Biotechnology, and Genetic Engineering for a 3D unique image for a vaccine. These technologies reduce the long-term duration of the selection of vaccines. After selecting vaccines, the manufacturers manufacture them with automated and robotic machines.

Covid-19 proved disruptive technologies' potentiality and revolutionary power in business and manufacturing under an interconnected system. 4<sup>th</sup> industrial revolution is a related business and manufacturing process under a digital, biological and physical combination with lower waste and pollution.

## **9. Conclusion**

Covid-19 shows great success in business and manufacturing by using disruptive technologies. It may be an example of the world of disruptive technology in humanity, like environmental protection and food production. The world can use these disruptive technologies in other areas for a better world. This will adopt the 4<sup>th</sup> industrial revolutionary system and technologies where there will be lower waste and pollution in industrial manufacturing.

Adopting the 4<sup>th</sup> industrial revolution will require more outstanding finance in technology and cooperation where the rich countries will have to come first. The international monetary and financial system will require fragmentation through participation in low-income and high-income countries.

Changes in the real income in the low-income and developing countries can create a more extended version of recession in these categories. Human capital development through education, training, and skill development is essential in these countries to adjust to the 4IR specifications.

Adopting new technologies always loses some jobs and creates new job opportunities. There needs the development of national skills in the government, public and private sectors.

The world is transforming toward a knowledge-based economy. Innovation is the critical factor in a knowledge-based economy for capital formation. Adopting disruptive technologies with capital can increase our country and the world's value, productivity, and income. It can help the post-pandemic socio-economic recovery.

Before recovery, the people and the small, medium, and large-scale industries need support from the government for a flexible tax policy, interest rate and lower energy costs to reduce the inflationary gap in our country.

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